

**WHAT IS CLAIMED IS:**

1. A method of predicting bone or articular disease in a subject, the method comprising the steps of:

5       determining one or more micro-structural parameters, one or more macroanatomical parameters or biomechanical parameters of a joint in said subject; and

          combining at least two of said parameters to predict the risk of bone or articular disease.

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2. The method of claim 1, wherein said combining comprises combining one or more micro-structural parameters and one or more macro-anatomical parameters.

15       3. The method of claim 1, wherein said combining comprises combining one or more micro-structural parameters and one or more biomechanical parameters.

20       4. The method of claim 1, wherein said combining comprises combining one or more macroanatomical parameters and one or more biomechanical parameters.

25       5. The method of claim 1, wherein said combining comprises combining one or more macroanatomical parameters, one or more micro-structural parameters and one or more biomechanical parameters.

6. The method of claim 1, wherein said bone or articular disease is fracture risk.

30       7. The method of claim 1, wherein the parameters are obtained from one

or more regions of interest in an image obtained from said subject.

8. The method of claim 7, wherein the image comprises a calibration phantom.

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9. The method of claim 1, wherein said parameters are selected from the group consisting of one or more of the parameters set forth in Tables 1, 2 and 3.

10 10. The method of claim 1, wherein said combining comprises univariate, bivariate or multivariate statistical analysis.

11. The method of claim 1, further comprising comparing said parameters to data derived from a reference database of known disease parameters.

15 12. The method of claim 1, wherein the bone is in a region selected from the group consisting of leg, knee, hip, spine and arm.

13. The method of claim 7, wherein the image is selected from the group consisting of an x-ray image, a CT image, an ultrasound image and an MRI.

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14. The method of claim 1, further comprising administering a compound to the subject.

15. The method of claim 14, wherein the steps are repeated at two or more time points and further wherein one time point is prior to administration of the compound.

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16. A method of determining the effect of a candidate agent on a subject's prognosis for musculoskeletal disease comprising:

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predicting a first risk of musculoskeletal disease in subject according to

the method of claim 1;

administering a candidate agent to said subject;

predicting a second risk of said musculoskeletal disease in said subject  
according to the method of claim 1; and

5 comparing said first and second risks, thereby determining the effect of  
the candidate on the subject's prognosis for said disease.

17. The method of claim 16, wherein said candidate agent is  
administered to the subject.

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18. The method of claim 16, wherein said administration comprises  
ingestion or injection.

19. The method of claim 16, wherein said candidate agent is selected  
15 from the group consisting of molecules, pharmaceuticals, biopharmaceuticals,  
agropharmaceuticals and combinations thereof.

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